

**WHAT IS CLAIMED IS:**

- 1 1. A shift pressure control apparatus for controlling a  
2 shift pressure to perform a shift in an automatic  
3 transmission, the shift pressure control apparatus  
4 comprising:  
5 a controller  
6 to determine a starting input-torque-dependent  
7 pressure from a transmission input torque at a start of a  
8 shift;  
9 to hold the shift pressure at the starting input-torque-  
10 dependent pressure during the shift;  
11 to monitor an operating parameter representing an  
12 engine load of an engine connected with the automatic  
13 transmission, to detect an engine load change; and  
14 to modify the shift pressure to a modified pressure  
15 determined by modifying the starting input-torque-  
16 dependent pressure with a difference between a second  
17 engine-load-dependent pressure determined from the  
18 engine load after the engine load change and a first  
19 engine-load-dependent pressure determined from the  
20 engine load at the start of the shift when the engine load  
21 change is detected.
- 1 2. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the controller is configured to detect the  
3 engine load change when a change in the operating  
4 parameter representing the engine load is greater than or  
5 equal to a predetermined value.

1 3. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the controller is configured to modify the  
3 shift pressure to the modified pressure determined by  
4 adding the difference between the second engine-load-  
5 dependent pressure and the first engine-load-dependent  
6 pressure, to the starting input-torque-dependent pressure.

1 4. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the controller is configured to detect the  
3 start of the shift; to store a value of the operating  
4 parameter and a value of the engine input torque at the  
5 time of detection of the start of the shift; to determine the  
6 starting input-torque-dependent pressure from the value of  
7 the engine input torque stored upon detection of the start  
8 of the shift, to hold the shift pressure equal to the starting  
9 input-torque-dependent pressure; to detect the engine load  
10 change during the shift; to store a value of the operating  
11 parameter at the time of detection of the engine load  
12 change; and to vary the shift pressure from the starting  
13 input-torque-dependent pressure to the modified pressure  
14 which is set equal to a sum of the starting input-torque-  
15 dependent pressure and the difference between the second  
16 engine-load-dependent pressure and the first engine-load-  
17 dependent pressure.

1 5. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the shift pressure control apparatus  
3 further comprises a throttle sensor to sense a throttle  
4 opening of a throttle valve for the engine, and the

5 operating parameter is the throttle opening sensed by the  
6 throttle sensor.

1 6. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the controller is configured to determine  
3 the starting input-torque-dependent pressure from the  
4 transmission input torque at the start of the shift,  
5 according to a pressure-torque characteristic of a desired  
6 input-torque-dependent fluid pressure with respect to the  
7 transmission input torque; and wherein the desired input-  
8 torque-dependent fluid pressure of the pressure-torque  
9 characteristic increases as the transmission input torque  
10 increases.

1 7. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the controller is configured to determine  
3 the first engine-load-dependent pressure from the  
4 operating parameter representing the engine load at the  
5 start of the shift, and the second engine-load-dependent  
6 pressure from the operating parameter representing the  
7 engine load after the engine load change, by using a  
8 pressure-load characteristic of a desired engine-load-  
9 dependent fluid pressure with respect to the operating  
10 parameter.

1 8. The shift pressure control apparatus as claimed in  
2 Claim 7, wherein the desired engine-load-dependent fluid  
3 pressure of the pressure-load characteristic increases as  
4 the engine load increases.

1 9. The shift pressure control apparatus as claimed in  
2 Claim 1, wherein the controller is configured to determine  
3 the first engine-load-dependent pressure from the  
4 operating parameter representing the engine load at the  
5 start of the shift, and the second engine-load-dependent  
6 pressure from the operating parameter representing the  
7 engine load after the engine load change, by using a  
8 pressure-load characteristic of a desired engine-load-  
9 dependent fluid pressure with respect to the operating  
10 parameter, set to restrain a shift shock in the transmission.

1 10. A shift pressure control process for controlling a shift  
2 pressure to perform a shift in an automatic transmission,  
3 the shift pressure control process comprising:  
4 determining a starting input-torque-dependent  
5 pressure from a transmission input torque at a start of a  
6 shift;  
7 holding the shift pressure at the starting input-torque-  
8 dependent pressure during the shift;  
9 monitoring an operating parameter representing an  
10 engine load of an engine connected with the automatic  
11 transmission, to detect an engine load change; and  
12 modifying the shift pressure to a modified pressure  
13 determined by modifying the starting input-torque-  
14 dependent pressure with a difference between a second  
15 engine-load-dependent pressure determined from the  
16 engine load after the engine load change and a first  
17 engine-load-dependent pressure determined from the  
18 engine load at the start of the shift when the engine load  
19 change is detected.

1 11. The shift pressure control process as claimed in Claim  
2 10, wherein the shift pressure control process further  
3 comprises  
4 detecting the start of the shift;  
5 storing a value of the operating parameter, as the  
6 engine load at the start of the shift and a value of the  
7 engine input torque, as the transmission input torque at  
8 the start of the shift, upon detection of the start of the  
9 shift;  
10 detecting the engine load change during the shift;  
11 storing a value of the operating parameter, as the  
12 engine load after the engine load change, upon detection of  
13 the engine load change; and  
14 adding the difference between the second engine-load-  
15 dependent pressure and the first engine-load-dependent  
16 pressure, to the starting input-torque-dependent pressure.